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This issue also contains a revised version of "Instructions to authors" and a feature on astronomical nomenclature.

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publishes papers on all aspects of astronomy and astrophysics: theoretical, observational and instrumental, independently of the techniques used to obtain the results: numerical analysis, optical, radio, particles, space vehicles, etc.

It is divided into thirteen sections. The titles of these are published in Sect. 1.2 of the unabridged version of *Instructions to authors* (revised May 1991 and published for the first time with the annual indexes for 1990).

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Instructions to authors

Revised May 1991

For both the *Main Journal* and the *Supplement Series*, authors are required to send 3 copies of the manuscript. The manuscript should be typewritten or computer-printed with double-line spacing, one side only, preferably on paper of international standard size (A4) with margins of *not less than 3 cm* at the top, at the left and at the bottom. The original figures (or, if easier to handle, *good quality* photographs of them) should be enclosed with the manuscript. Well-styled, *good quality* tables may also be submitted as artwork (i.e. camera-ready). Special instructions for *Letters to the Editor* are given below (Sect. 4). As an alternative to preparing conventional manuscripts (for typesetting), authors are encouraged to make use of one of the two software packages for T_EX and L^AT_EX which have been developed by Springer-Verlag: *Springer-Verlag Plain-T_EX A&A macro package 1991* and *Springer-Verlag L^AT_EX A&A style file 1990*. These packages were designed for the *Main Journal* and have been adapted for the *Supplement Series*. Authors using these packages should submit with the diskette (3.5" or 5.25") at least one complete copy of the manuscript, including the figures and tables (printer's copy). Further information on the macro packages may be obtained from the Editors or the respective publishers of the two journals^{1,2}. The packages may be obtained free of charge directly from Springer-Verlag¹. Authors should specify which disk size they require.

1. Preparation of conventional manuscripts

1.1. General remarks

Papers should preferably be written in English. Authors who are not sufficiently familiar with English should seek help from colleagues proficient in the language. Papers in French and German will also be accepted.

Well-prepared manuscripts move easily and smoothly through the hands of editors and typesetters; the risks of delay and error are minimized.

1.2. Title page

The following items should be given on the first page (title page). Items (1) to (5) are for the typesetter and will occupy most of the

page. Items (1) to (4) belong to the title block and should be separated from item (5) (the footnotes) by adequate space and a dividing line.

(1) The title, concise but informative. The title should not be written entirely in capital letters; capitals should be used only at the beginning of the first word, at the beginning of proper names, and for any formula letters or units which are normally capitalized. Subtitles (to be typeset in a smaller print size) are only allowed for numbered papers of a series.

(2) The initial(s) and name(s) of the author(s). The names should not be capitalized throughout. They should be footnoted with numbers for the addresses.

(3) The full institutional addresses of all authors, marked by the footnote numbers. The same style of capitalization as for (1) and (2) above should be followed, e.g. La Silla, Chile not LA SILLA, CHILE.

(4) The dates of receipt and acceptance. These will usually be inserted by one of the Editors.

(5) Footnotes to the title, the authors' names or (in rare cases) the institutional addresses. These usually begin with the obligatory line *Send offprint requests to: ...* This line should of course be omitted if there is only one author and one address. If the author to whom the requests are to be sent has given more than one address on the title page, the one to be used should be given in an abbreviated form in parentheses, e.g. G. Galilei (Armagh Observatory). Further footnotes to the title block should be placed after the line for offprint requests and should be marked by asterisks (not numbers).

Items (6) to (9) below are of interest to the Editors and the Publisher only, not the typesetter. They should therefore be placed at the foot of the title page beneath a separating line.

(6) The authors' proposed choice of journal: *Main Journal* or *Supplement Series*.

(7) The section under which the authors propose that the paper should appear in the table of contents. The titles of the thirteen sections are as follows:

1. Letters
2. Cosmology
3. Extragalactic astronomy
4. Galactic structure and dynamics
5. Stellar clusters and associations
6. Formation, structure and evolution of stars
7. Stellar atmospheres
8. Diffuse matter in space (including H II regions and planetary nebulae)
9. The Sun
10. The solar system

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² Les Editions de Physique, Avenue du Hoggar, Zone Industrielle de Courtaboeuf, BP 112, F-91944 Les Ulis Cedex, France. Telex: 692 321 EDITPHYS. Telefax: 169288491.

11. Celestial mechanics and astrometry
12. Physical and chemical processes
13. Instruments, data processing, and computational methods

(8) A maximum of 6 thesaurus code numbers. These numbers correspond to *key words* (see Section 1.5 below) and are to be found in the *Thesaurus of key words* published together with the annual indexes. As the *Thesaurus* is revised from time to time, authors should take care to use only the most recent version (to be found in issue 226/2, 1989 and the supplementary issue for the 1990 indexes, published in May 1991). For Thesaurus codes characterized as "individual", the commonest name of the object should be added to the number, e.g. 07.11.1 M 82, 16.14.1 Crab pulsar, 19.42.1 EG And. Each individual object counts as one code (or key word).

(9) The name of the author to whom proofs should be sent. As it is possible that some proofs may be sent by a courier service rather than by ordinary mail, authors should ensure that the name of the street is given in the address. (If there is a P.O. box this should certainly be given as well.) Furthermore, if the courier services have problems with the delivery, a telephone, telex or telefax number can be very useful.

1.3. Manuscript pages

The pages should be placed in the following order:

- title page
- abstract and key words
- text and acknowledgements
- appendices
- references
- figure captions
- tables
- copies of the figures (optional)

All pages (except figure copies) should be numbered consecutively, beginning with the title page.

1.4. Abstract

The *Abstract* should be complete in itself, summarizing concisely the aims and content of the paper. For papers in English, the length of the Abstract should be 3-4% of the total length of the paper. For papers in French or German, the abstract should be preceded by an English translation of the title of the paper. The Abstract that follows this should be in English and correspond in length to about 10% of the paper itself; it should give as much factual information as possible. The correct style for beginning the Abstract is a boldface side heading, beginning with a capital letter, ending with a full stop and run in with the text.

1.5. Key words

A maximum of 6 key words should be given after the Abstract. They should be taken from the published *Thesaurus* and must correspond to the codes given on the title page (see item 1.2(8) above). As for the Thesaurus codes, the commonest names of "individual" objects should be given. As for the Abstract, a boldface side heading should be used but ending with a colon instead of a full stop. The individual key words should be separated by dashes.

1.6. Sections in the text

These should be numbered with *arabic* (not roman) numerals. Subsections (second order) should be numbered with 1.2., 1.3.,

etc., and sub-subsections (third order) with 1.1.1., 1.1.2., etc. It is not advisable to subdivide the text any further, though italic run-in side headings are possible for short fourth-order sections. Authors who have access to boldface and italics should preferably use these to write the headings in the style required by the typesetter, i.e. first order: **boldface**, second order: *italics*, third order: normal roman. The rules concerning capitalization in titles (see item 1.2(1) above) also apply to headings in the text.

Indentation: Headings should *never* be indented. The first paragraph immediately following a free-standing heading should also *never* be indented. All other paragraphs (from the second one in a section onwards) *should be indented*.

1.7. Footnotes to the text

These should be kept to a minimum and numbered consecutively with arabic numerals as superscripts but without any parentheses.

1.8. Equations

Equations should always begin flush left (i.e. not centred). Using arabic numerals in parentheses at the right-hand edge of the text, equations should be numbered either (i) sequentially throughout the entire text, or (ii) sequentially section by section. Method (i) is recommended for short papers; method (ii) is recommended for longer papers, provided of course that they contain a large number of equations. If sentence punctuation is used, the commas or full stops should be placed directly after the equations, not after the equation numbers. To economize on space, equations should be written as far as possible in a linear form, provided there is no loss of clarity.

Examples: $7/8$; $(a+b)/c$; $a/b(b+c)$;

$$\exp(-(x^2+y^2)/a^2); (a+b)^{1/2}$$

$$\frac{\cos(1/x)}{(a+b/x)^{1/2}}.$$

This principle also applies to short formulae or terms used in the running text. Here, for example, stacked fractions would disturb the evenness of the line spacing.

In the case of long equations, the author should indicate where they can be split.

1.9. Literature citations

References are normally cited in the text by placing the name(s) and the year, without any comma between them, in parentheses. If there are two authors for one citation, both names should be given, separated by an ampersand (&). If there are more than two authors, only the first name should be given, followed by "et al.". Commas should only be used to separate two or more years linked with the same author (author group). If two or more citations are made in one set of parentheses, they should be separated by a semi-colon. If more than one citation for a particular author (author group) is made for the same year, "a", "b", "c", etc. should be added to the year. If citations are made within the normal running text, only the year(s) should be placed in parentheses. The following examples will illustrate the required style:

- (Copernicus 1986)
- (Copernicus & Galilei 1988)
- (Hubble et al. 1985; Newton et al. 1987; Ptolemaeus & Copernicus 1989a,b, 1992)
- Recently Galilei et al. (1992, 1993) showed that ...

Authors' initials are permitted only in exceptional cases; for example, to distinguish between two authors with the same surname. Each literature citation made in the text should have a corresponding entry in the *References* at the end of the paper (see Sect. 1.12 below). For frequently cited papers an abbreviated form of citation is recommended, e.g. Paper I, Paper II (if appropriate) or by the initial letters of the authors' surnames. The abbreviation should be defined at the first place of mention in the text.

1.10. Some aspects of typographic style within the text

1.10.1. Capitalization and non-capitalization

The following should be capitalized: (a) Proper names. (b) The names of astronomical objects such as "the Sun", "the Moon", "the Galaxy", and "the Local Group". (c) Abbreviations and expressions in the text such as Fig(s), Tables(s), Sect(s), Eq(s), Paper(s), etc. but only when used with numbers, e.g. Fig. 3, Table 1, Paper III, Eq.(7).

The following should *not* be capitalized: (a) General concepts which are not proper names (e.g. active galactic nuclei, charge-coupled device) even though the usual abbreviations for these may be capitalized (AGN, CCD). (b) The names of chemical elements (e.g. hydrogen, carbon, magnesium) even though the corresponding chemical symbols are always capitalized (H, C, Mg). (c) The words figure(s), table(s), equation(s), paper, etc. when used without an accompanying number.

1.10.2. Abbreviations

(a) The following should be abbreviated when they appear in the running text followed by a number *unless* they come at the beginning of a sentence: Sect(s), Fig(s), Eq(s). For example: "The results are depicted in Fig. 5. Figure 6, however, shows that ...". Note that equation numbers in the text are identified principally by the use of parentheses, e.g. Eq.(5), Equations (11) and (12). Alternative words such as "expression" or "relationship" (without capitalization) are permitted but the corresponding number should always be in parentheses.

Abbreviations of concepts, methods, instruments, observatories, etc. may be used throughout the text but the full wording with the abbreviation in parentheses should be given *once* in the *Abstract* (if appropriate) and/or *once* at the first place of mention in the main text (usually in the *Introduction*).

Examples: ... magnetohydrodynamic (MHD) ...
... very long baseline interferometry (VLBI) ...
... Westerbork Radio Telescope (WRT) ...

1.10.3. Foreign words and phrases

Only foreign words or phrases that have *not* come into general use should be italicized. If a word or its abbreviation can be found in the main body of *Webster's* (and this also applies to British usage), it should *not* be italicized; for example: cf., et al., e.g., a priori, in situ, bremsstrahlung, eigenvalues.

1.10.4. Units, symbols, and nomenclature

In general, authors should leave the mark up of the manuscript to the publisher's editorial staff since they try to follow a uniform procedure which the typesetters are accustomed to. However, authors can considerably help the publisher by observing the following rules:

(a) The text should make clear distinctions between physical variables, mathematical symbols, units of measurement, ab-

breviations, chemical formulae, etc. If certain variables are not defined in the text itself, they should be defined if necessary in marginal notes or on a separate sheet enclosed with manuscript. This also applies (i) in the case of unusual signs or symbols which a typesetter may not be able to recognize, and (ii) if special typefaces such as Script, Sanserif, Gothic or Special Roman are required. Machine-written Greek letters do not normally need to be marked; but if they are handwritten, they should certainly be named in the margin at the first place of mention.

(b) Authors who have access to italic and boldface should use these to identify physical or mathematical variables. In general, variables are set in normal italic, vectors in boldface italic. Physical constants such as the speed of light, the Boltzmann constant, the Hubble constant and the solar mass are also set in normal italic.

(c) Italic should never be used in the manuscript for units of measurement (e.g. km, g cm⁻³, K, erg cm⁻² s⁻¹) or for chemical formulae unless, of course, these items fall within a piece of text that is entirely in italic.

(d) As far as possible *italic should be avoided* for the following: (i) mathematical signs such as "d" (total differential), "e" (base of natural logarithms), "i" (imaginary unit), "π" (3.14159...), and abbreviations such as "sin", "cos", "log", "exp", "Im"; (ii) Letters or abbreviations used as sub- or superscripts to variables, but serving merely as labels, e.g. T_{eff} , $(Q)_d$ (d = dust), m_e (e = electron). However, in conformity with the rest of the text, *italic should be used* if the sub- or superscripts are variables in themselves.

(e) For common units of measurement (SI and non-SI), standard abbreviations should be used. Unusual units may, at the authors' discretion, be written in full, at least at the first place of mention. Some traditional, non-SI units persist in astronomy literature. Some are acceptable (e.g. erg, ångström/Å) but others are obsolescent and should be avoided (e.g. micron/μ). Compound units in which the meaning "per" is implied can be written using either a solidus or a negative index; *Astronomy and Astrophysics* prefers the latter style, e.g. km s⁻¹ instead of km/s.

(f) Using marginal notes if necessary, clear distinctions should be made in the manuscript between characters which may be easily confused.

Examples: I, l, and 1
the letter O and 0
p and q
v and v
x and x

(g) For the correct naming of astronomical objects outside the solar system, it is suggested that authors refer to the recommendations on nomenclature given by the International Astronomical Union (printed in this issue on pp. A11–A13).

Useful references for points (a) to (g) in this section are as follows:

- (i) *Quantities, Units and Symbols*, 1975 (Addenda 1981), The Royal Society, London
- (iii) *Symbols, Units and Nomenclature in Physics*, International Union of Pure and Applied Physics, 1978, in: *Physica* 93A, pp. 1–60
- (iv) *Symbole, Einheiten und Nomenklatur in der Physik*, 1981, Physik-Verlag, Weinheim (FRG)
- (v) *The IAU Style Manual (1989)*. *The Preparation of Astronomical Papers and Reports* published in "Transactions of the International Astronomical Union", Vol. 20B, pp. Siii–S50

1.11. Acknowledgements

The text for this should be written in one paragraph only. The heading should preferably be written as an italic side heading, run in with the text.

1.12. Appendices

First-order (boldface) headings should be styled as shown in the following examples:

(a) Only one appendix, additional heading optional:

Appendix

Appendix: derivation of Eq. (6)

(b) Two or more appendices, additional headings optional:

Appendix A

Appendix B

Appendix A: age distribution and cosmic-ray propagation

Appendix B: distribution of cosmic rays

Second-order (*italic*) headings should be numbered with *A.1.*, *B.1.*, *C.1.*, etc. Third-order (roman) headings should be numbered with *A.1.1.*, *B.1.1.*, *C.1.1.*, etc.

Equations should be numbered with the appropriate letters and numbers in parentheses but without full stops, e.g. (A2), (B7), (C15).

1.13. References

The reference list should contain all the citations occurring in the text, ordered alphabetically by surname (with initials following). If there are several references to the same first author, they should be entered according to the following scheme:

(a) One author: chronologically.

(b) Author + one co-author: alphabetically by co-author, then chronologically.

(c) Author + two or more co-authors: chronologically.

The number of authors listed in a single reference should be limited to *five*. If a particular work was written by more than five authors, only the first *three* should be listed, followed by "et al." This rule also applies to the number of editors in the case of edited works.

In the new styling for the references, introduced in 1990, the use of italics and boldface has been abolished, and the punctuation has been simplified. Simplified abbreviations are now used for the commonest astronomy journals. A list of these is given in Sect. 1.13.1 below. A sample list of standard abbreviations for other journals is given in Sect. 1.13.2. A sample reference list showing the required style is given in Sect. 1.13.3.

Journals: References to journals should normally only contain the authors' names, the year, the name of the journal (abbreviated), the volume number and the number of the first page. Neither the title of the paper itself nor the last page number should be given.

Monographs: An entry for a monograph should include the title of the book, the name of the publisher, the place of publication and, if appropriate, the relevant page number(s).

Edited works: Entries for handbooks, series, conference proceedings, etc. should include the title of the relevant chapter, the name(s) of the editor(s), the title of the complete work, the name of the publisher, the place of publication and the first page number.

Items which are not yet published may be included in the list of references and denoted by "in preparation", "submitted", or

"in press". As far as possible authors should update these references when making their corrections in the page proofs. This also applies to items characterized as "preprint" or "private communication" if these have turned into publications at a later date.

1.13.1. Simplified abbreviations of frequently used journals

ARA&A	Annual Review of Astronomy and Astrophysics
Afz	Astrofizika
AJ	Astronomical Journal (the)
AZh	Astronomiceskij Zhurnal
A&A	Astronomy and Astrophysics (<i>Letters indicated by the page number</i>)
A&AS	Astronomy and Astrophysics Supplement Series
A&AR	Astronomy and Astrophysics Review (the)
ApJ	Astrophysical Journal (the) (<i>Letters indicated by the page number</i>)
ApJS	Astrophysical Journal Supplement Series (the)
Ap&SS	Astrophysics and Space Science
BAAS	Bulletin of the American Astronomical Society
JA&A	Journal of Astrophysics and Astronomy
MNRAS	Monthly Notices of the Royal Astronomical Society
Nat	Nature
PASJ	Publications of the Astronomical Society of Japan
PASP	Publications of the Astronomical Society of the Pacific
PASPC	PASP, Conference Proceedings
QJRAS	Quarterly Journal of the Royal Astronomical Society
Sci	Science
SvA	Soviet Astronomy

1.13.2. Standard abbreviations of other astronomy journals

Acta Astron. Sin.	Acta Astronomica Sinica
Acta Astron.	Acta Astronomica
Ark. Astron.	Arkiv for Astronomi
Astron. Nachr.	Astronomische Nachrichten
Aust. J. Phys.	Australian Journal of Physics
Aust. J. Phys. Astrophys.	Australian Journal of Physics
Suppl.	Astrophysics Supplement
Chin. Astron.	Chinese Astronomy
C.R. Acad. Sci. Paris	Comptes Rendus de l' Acad mie des Sciences
IAU Circ.	International Astronomical, Circular
Icarus	Icarus
Ir. Astron. J.	Irish Astronomical Journal
J.R. Astron. Soc. Can.	Journal of the Royal Astronomical Society of Canada
Mem. R. Astron. Soc.	Memoirs of the Royal Astronomical Society
Mem. Soc. Astron. Ital.	Memorie della Societa Astronomica Italiana
Mitt. Astron. Ges.	Mitteilungen der Astronomischen Gesellschaft
Mon. Notes Astron. Soc.	Monthly Notes of the Astronomical Society of South Africa
S.Afr.	Observatory (the)
Observatory	Philosophical Transactions of the Royal Society of London, Ser. A
Phil. Trans. R. Soc. London Ser. A	

- Proc. Astron. Soc. Aust. Proceedings of the Astronomical Society of Australia
 Rev. Mex. Astron. Astrofis. Revista Mexicana de Astronomía y Astrofísica

1.13.3. Sample reference list

Attention should be paid to the order of the items in each reference and to the punctuation used.

- Bohr N., Einstein A., Fermi E., 1992, MNRAS 301, 257 (BEF)
 Curie M., Curie P., 1991, A&A 248, 612
 de Gaulle C., 1996, Solar Astronomy. Oxford Univ. Press, Oxford
 Heisenberg W., Yang C.N., 1993, Chin. Astron. 537, 36 (Paper III)
 Laurel S., Hardy O., 1994, Active Galactic Nuclei. In: Churchill W., Roosevelt F.D., Stalin J. (eds.) The Evolution and Distribution of Galaxies. Wiley, New York, p. 210
 Shakespeare W., Goethe J.W. von, Molière J.-B., et al., 1955, Supernova 1994D. In: Duck D., Mouse M. (eds.) Proc. IAU Symp. 408, The Physics of Supernovae. Reidel, Dordrecht (in press)

1.14. Figure captions

Figure captions should be started on a separate sheet. Like the main text, they should also be typed with double-line spacing and adequate margins. Additional space should be left between each caption to allow for any instructions which the production editor might need to enter for the typesetter.

Each caption should be written as a single paragraph without indentation. (In exceptional cases, displays or short tables are possible.) Each caption should begin with a boldface side heading, run in with the rest of the text; the first word is always abbreviated (i.e. **Fig.**). Part figures should be indicated by boldface letters (**a**, **b**, **c**, etc.) but without punctuation. (However, these letters may be placed in parentheses if they occur *after* the piece of text to which they refer.) If appropriate for the size and nature of the part figures, separate captions may be written. Figure captions have no end punctuation. The following examples will illustrate the required style (after typesetting):

Fig. 1. Spectrum of the cosmic blackbody radiation in the radio window

Fig. 7a and b. MSDP observations made on April 14 1994: **a** intensity map, **b** velocity map

Fig. 2a-d. Flares observed at Debrecen Observatory: **a** June 15, 06:24UT (event 1), **b** June 15, 14:17UT (event 4), **c** June 16, 06:30UT (event 9), **d** June 17, 08:01UT (event 12)

Fig. 4. a Blackman-Tuckey power spectra of sunspot areas. **b** FFT power spectra of sunspot areas

Fig. 12a. Spectra of the nucleus and extranuclear regions of Mkn 930

Fig. 12b. Ionized gas velocity field in Mkn 930 along PA = 0

1.15. Tables

Like figure captions, tables should be given on separate pages at the end of the manuscript. Unless very short, each table should begin on a new page. As for figure captions, adequate space

should be left for the production editor. Table captions should be typed directly *above* the respective tables. Each caption should begin with a boldface side heading, followed by a full stop. Arabic numbering should be used. The word "Table" should not be abbreviated and only the "T" should be capitalized. The rest of the caption should be typed in roman, beginning with a capital letter and without end punctuation.

Generally, a table should contain only horizontal lines, in most cases only three: two for the boxhead, one at the foot. If any columns are subdivided into smaller categories, intermediate lines of the required length should be inserted. Vertical lines should be inserted only in exceptional cases (for the sake of clarity). The columns should be ranged flush left, not centered. Footnotes should be marked by superscript letters rather than by numerals, asterisks, etc. However, references which are detailed in a footnote can be referred to in the table by means of normal-sized arabic numerals. Italic subheadings may be used within the table if required. In such cases, adequate space should be left between the subheading and the previous section of the table. Each new separate, verbal item in each part of the table (boxhead, main part and footnote) should begin with a capital letter.

Further details on the styling of tables may be obtained by inspecting examples of typeset tables in the journal itself. Details on camera-ready tables are given in Sect. 2.

2. Artwork

2.1. General remarks

Authors should bear in mind that the final printed quality of illustrations can never be better than the quality of the original artwork. The publisher cannot accept responsibility for improving poor-quality artwork; for example, relabelling or redrawing line figures. Inadequate artwork will therefore have to be rejected.

All artwork belonging to an article should be placed in an envelope or folder and thus kept protected from damage and separate from the manuscript pages.

2.1.1. Line drawings

Good-quality figures have the following characteristics:

- (a) They are drawn with Indian ink (or an equivalent) and have lines, letters, numbers and symbols of uniform strength and contrast.
- (b) As far as possible, the labelling is uniform in size.
- (c) The lettering is not pasted on to the figures as it may easily become detached.
- (d) There are no faint or broken lines, letters, numbers or symbols.
- (e) Unnecessary headings, which often only repeat information otherwise given in the figure captions, have been omitted.
- (f) On graphs there are no large gaps between the labels of axes and the axes themselves.

Further points to observe are as follows:

- (g) Figures containing quantitative information should have four borders, each with fiducial marks; this will enable values to be read off more easily.
- (h) Each *part figure* should contain its own alphabetical labelling, ready for photographic reproduction. Bold lower case letters should be used.

(i) All labelling with words, units of measurement, etc. should conform as far as possible to the principles of typographical style described for manuscript preparation in Sect. 1 above.

(j) Each figure should be surrounded by a border of at least 2 cm. Using a smudge-free pen or pencil, the number of the figure should be written in this border, preferably in the right-hand corner (i.e. on the *front* of the figure, not the back).

(k) After photographic reduction, all details of the figures should still be visible and all labelling legible (see Sect. 2.2. below).

2.1.2. Halftones

Combined halftone and line figures: Points (a) to (k) above are applicable to such figures.

Complete halftones: These are usually black-and-white photographs. If they do not have a margin, they should be labelled on the back using a smudge-free pen or pencil. For economical reasons, the entire area of a halftone is not usually reproduced; in any case, the outside edges often convey no essential information. It is important therefore that authors mark exactly (on a photocopy or on a transparent cover to the figure) the area of interest which needs to be photographically reproduced.

Coloured figures: The points given above for halftones also apply to coloured illustrations. Authors will be expected to make a contribution towards the cost of four-colour reproduction and printing. The present rates (inclusive and tax-free) are DM 980 for the *first page* of coloured illustrations (irrespective of the size and number of the figures) and DM 500 for each additional page.

2.1.3. Camera-ready tables

Generally only large and detailed tables are suitable for direct reproduction. Some of the points mentioned in Sect. 2.1.1 on quality are also applicable to tables. If possible, a typeface resembling the one used in A. & A. (Times Roman) should be used. Tables of inadequate quality or those which do not reasonably conform to the typographic style of the journal (see Sect. 1.15 above) will not be accepted for direct reproduction.

2.2. Scaling of artwork

As far as possible, authors should plan the size and shape of each figure so that after reduction they will fit into column width (max. 88 mm). If necessary, figures may reach across the entire page width (max. 180 mm). Intermediate widths with a side caption are also possible. For certain figures a side-turned (landscape) format may be favourable.

The production editor will determine the percentage reductions, but authors can help by indicating which figures in their article are of major importance and should therefore not be too strongly scaled down. This applies not only to line drawings but also to halftones. If the size of a halftone has to be corrected at the proof stage, a completely new (and costly) reproduction is usually necessary.

Many figures are reduced to about 50% of their original size. Very few figures have a final size outside the range of 40–85%. The final size of capital letters or numerals in a figure usually lies within the range 1.8–2.5 mm. After reduction lines should be no thinner than 0.1 mm. In the preparation of their figures, authors should pay attention to the strengths of lines and any other fine details. One common problem is that some features (e.g. dotted lines) virtually disappear after reduction. The other extreme

should be avoided: for example, heavy lettering and thick lines on a figure still look ugly after reduction to 40% or lower.

As far as possible, camera-ready tables should be planned so that after scaling down they will fit into either column or page width (with a final type size similar to that described above for figures). Intermediate widths are possible and a side-turned format will be used in exceptional cases.

2.3. Positions of figures and tables in the text

Each figure and table should be mentioned by number at least once in the text. The desired position of each figure and table should be given in the left-hand margin of the text. These positions will be taken into account during page make-up.

3. The proof correction stage

Authors will receive two sets of page proofs (a master and a duplicate), together with the original manuscript, the original artwork and an order form for offprints.

3.1. Corrections

The duplicate proof is for the authors' own reference and need not be returned to the publisher. Corrections should be made on the master proof (which sometimes contains the typesetter's own corrections and comments) using a red pen or pencil. The final responsibility for correcting the proof lies with the authors. The corrections should therefore be clear and unmistakable; the use of standard proof correction marks is recommended.

The main aim of proof reading is to correct errors, particularly of typesetting, but not to alter the content. The reproduction of the artwork and the layout of the pages should also be carefully checked. Corrections that might lead to a change in the page make-up should be avoided. If necessary, new results or information may be given in the form of a short "Note added in proof" which will be placed at the foot of the last page. If a longer "Note" is required, the authors should first consult one of the Editors.

If excessive changes to the text are made, the authors will be required to pay for the additional costs. This also applies to new reproductions of corrected artwork. If a figure or a camera-ready table needs to be corrected or replaced, the authors must ensure that a corrected or new version is enclosed with the page proof.

The master proof, corrected and signed by one of the authors, should be returned to the publisher as quickly as possible.

3.2. Offprint orders

The offprint order form must be filled in and returned *together with the corrected proof*. If for some reason authors do not receive a copy of the form, a short covering letter, indicating the number of offprints required, will serve as a substitute. If the publisher receives no order of any kind from the authors, he will assume that only the 50 free offprints are required and order these accordingly from the printer. Since offprints are produced by a run-on procedure during the printing process, any belated orders which arrive when the relevant issue of the journal is already in press can no longer be fulfilled.

Official purchase orders from institutes, university libraries, organizations, etc. should reach the publisher *not later than four weeks after the page proof*.

4. Letters to the Editor

4.1. General remarks

Every attempt will be made to ensure that Letters are published within 6-10 weeks after receipt of the camera-ready manuscript by the publisher. Initially a draft version of the Letter should be submitted to the Letter Editor. He will then contact the authors regarding provisional acceptance and also send full details on the procedure to be followed for the submission of the final camera-ready version. A few essential points may be mentioned here.

Letters are limited to four printed pages.

4.2. Title page

The title block will be typeset separately and combined later with the camera-ready text. The text for the title block should therefore be typed on a separate sheet. On the first of the camera-ready pages, sufficient space should be left for the insertion of the title block. The exact amount of space to be left free is shown on the special camera-ready sheets (see Method (a) below).

4.3. Camera-ready pages

The camera-ready manuscript may be prepared by one of three methods:

(a) The text can be typed onto specially prepared large-format sheets which are available from the Letter Editor. The print must be in standard typewriter size (approx. 10.5 pica points) as the text will later be reduced photographically to 75%. Gaps should be left in the text for any artwork. Line drawings and tables, *but not halftones or coloured figures*, should be pasted into the text at

the appropriate positions. (Because they have to be screened, black-and-white halftones and coloured illustrations will be reproduced separately and inserted when the film pages are made up.)

(b) Using a word-processing program (such as Word or WordPerfect) in combination with a page-layout program (such as Pagemaker or Ventura), authors can print out the text in the format required by the journal. If the quality of the printout is satisfactory, the pages can be used for direct 1:1 reproduction. The handling of artwork is the same as for Method (a).

(c) The Springer *Plain-TEX* or *L^AT_EX* macro packages (*details are given in the opening paragraph of these instructions*) can also be used to generate printouts in CMR (Computer Modern Roman) fonts which are qualitatively suitable for direct reproduction.

(N.B. The macro packages are normally used to produce a DVI (device-independent) file which can be further processed to photocomposition by the printers. This application is not recommended for Letters at the present time since technically there are more steps involved which make the whole process slower than for camera-ready Letters. Authors should also note that the printouts in simulated MT (Monotype Times) fonts are qualitatively *unsuitable* as camera-ready manuscripts.)

Authors using Methods (b) or (c) should note that any artwork should be treated in the same way as for Method (a) since the publisher needs to have ready laid out pages for direct reproduction. Any artwork (*except for halftones or coloured figures*) should therefore be carefully and accurately pasted into the gaps in the text. If the text has been prepared by Method (c), any frames generated by the program should be removed or covered up when the artwork is inserted.

**Specifications concerning names,
designations, and nomenclature
for astronomical radiation sources outside the solar system**

Recognizing the need for clear and unambiguous nomenclature of all astronomical sources of radiation, the prolific increase in the number of identified sources, and the requirements for data storage and information retrieval, the following set of specifications (developed and endorsed by the International Astronomical Union) is recommended for use throughout the field of astronomy for radiation sources outside the Solar System. All authors of papers and contributors to data bases of any kind are urged to adhere to these specifications, since otherwise significant data may be irretrievably lost. When existing designations are used in listings, they should never be altered.

All object listings shall always contain next to the acronym a second designation, or positional information.

The *designation* of an astronomical source shall consist of the following parts :

Origin Δ Sequence Δ (Specifier)

Note that the triangle (Δ) is used here to denote a blank space: the parentheses are required if a specifier is included. *Origin* and *sequence* are essential, *specifier* is optional; the number of blanks may be larger in machine-readable files to right justify numerical or tabular data.

The following *examples* illustrate the recommended form of astronomical designations :

NGC Δ 205
PKS Δ 1817-43
CO Δ J0326.0+3041.0
H2O Δ G123.4+57.6 Δ (VLSR=-185)
3CR Δ 196

The *origin* is a "word" or acronym to specify the catalog or collection of objects. It may be constructed from catalog names (*e. g.* NGC, BD), the names of authors (RCW), types of objects (PSR, PN), types of sources (13CO, HCN), instruments or observatories used (VLA, IRAS), *etc.*

The following rules apply to the construction of *new* origins :

- . *Origin* shall consist of at least two characters.
- . *Origin* shall consist of letters and/or numerals only; special characters should be avoided, as well as indices and exponents.
- . *Origin* shall be unique, *i. e.*, the appropriate reference literature (see below) should be checked to avoid duplication with existing catalog designations, constellation names, abbreviations of object types, *etc.*
- . The authors of a catalog shall specify in their article which acronym is to be used in *origin*. Avoid too long acronyms. Conversely, users shall never abbreviate *origin*.

The *sequence* is normally a numerical field to uniquely determine the object within a catalog or collection. It may be a sequence number within a catalog (*e. g.*, HD Δ 224801), or it may be based on coordinates.

If coordinates in any form are used to encode an object, the following rules apply :

- . Coordinates shall always be preceded by J for Julian 2000 equatorial coordinates, and should be preceded by G for galactic coordinates, B for Besselian 1950 equatorial coordinates. The absence of code at the beginning of recognizable equatorial coordinates will be interpreted, by default, as a missing B.
- . Coordinates shall be specified as LLL.ll \pm BB.bb for galactic coordinates, and for equatorial coordinates as HHMMSS.ss \pm DDMMSS.s, without spaces; fewer digits may be used as appropriate.
- . Coordinates shall be truncated (not rounded), thus defining a unique (small) field on the sky in which the object is located.
- . Coordinates shall contain leading zeroes, and the plus or minus sign : \pm BB.bb or \pm DDMMSS.s
- . Coordinates used in designations shall be considered as names; therefore, they shall not be changed even if the positions change or become more accurately known (*e. g.*, BD -25 765 stays, even though its declination is now -26°).
- . If at some stage subcomponents or multiplicity of objects is recognized, the best designation solution is to name the subcomponents with letters or numerals, which then are added to *sequence* with a colon, *e. g.*, NGC 1818 : B12.

The *specifier* is optional and allows one to indicate association with larger radiating bodies (*e. g.*, M Δ 31, W Δ 3) or to indicate other object parameters. However, they are *not* required syntax and are enclosed in parentheses.

Examples of complete designations are :

Designation	Position	
Origin Δ Sequence Δ (Specifier)	RA(2000)	DEC(2000)
BD -3 5750	00 02 02.4	-02 45 59
H2O J0446.6+7253.7	04 46 37.3	+72 53 47
AC 211 (=1E2127+119; M15)	21 30 15.54	+11 43 39.0
PN G001.2-00.3	17 49 36.9	-28 03 59
R 136 : a3 (30 Dor)	05 38 42.4	-69 06 03

There exists a multitude of improper, confusing or unclear designations in the literature. General rules and advices on how to generate designations can be found in "The First Dictionary of the Nomenclature...", cited below. Examples of improper designations are :

BD 4° 14	use of " ° ", declination sign missing
N221	no space, unclear source : NGC or N in LMC ?
DLB J204+2	leading zero missing; poor position
P 43578	one letter origin is ambiguous
MG 0400+3645	missing prefix J for Julian 2000 equatorial coordinates

Advice on specific problems may be obtained from representatives of the "Clearing house", a subset of the Working group on Designations of IAU Commission 5 :

P. Dubois	Observatoire de Strasbourg 11 Rue de l'Université F-67000 Strasbourg, France	Phone 88-35-43-00 Telex 890506 Code Starobs Bitnet U01108@FRCCSC21
W. H. Warren	Astronomical Data Center Code 933 NASA, Goddard Space Flight Center Greenbelt, MD 20771, USA	Phone (301) 286-8310 Fax (301) 286-3221 Telex 89675 Code NASCOM Bitnet w3whw@scfvm
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H. R. Dickel	Astronomy Dept. Univ. of Illinois 1002 W. Green Street Urbana, IL 61801-3000	Phone (217) 244-7044 Internet lanie@rigel.astro.uiuc.edu Fax (217) 244-7638 (sparingly)

For general information, in particular about existing designations, consult the following references :

Fernandez, A., Lortet, M.-C., Spite, F. 1983, *The first Dictionary of the Nomenclature of Celestial Objects*, A&AS, 52, N° 4

Lortet, M.-C., Spite, F. 1986, *First Supplement to the First Dictionary of the Nomenclature of Celestial Objects*, A&AS 64, 329

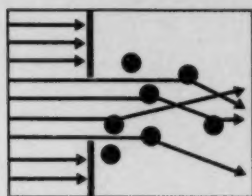
Dickel, H. R., Lortet M.-C., de Boer, K. S. 1987, *Designation and Nomenclature for Diffuse Radiating Sources*, A&AS, 68, 75

Jaschek C. 1988, *Data in Astronomy*
Cambridge University Press

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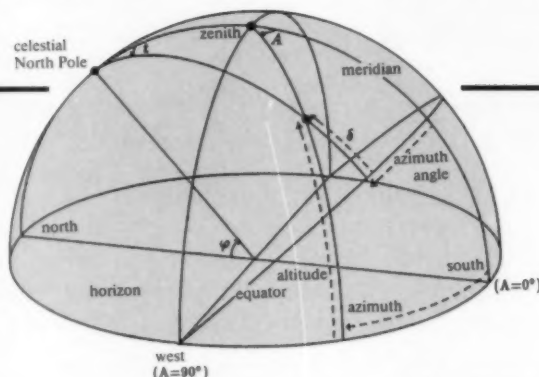
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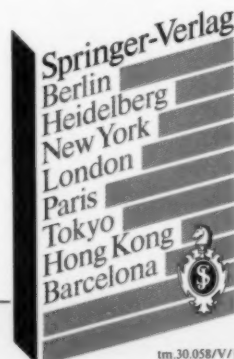
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07.11.1 Arp 220; 07.11.1 M 51; 07.11.1 NGC 4472

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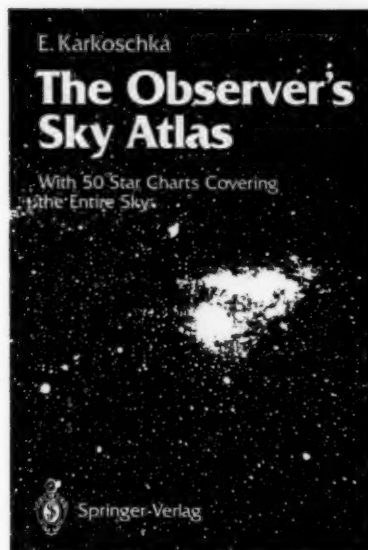
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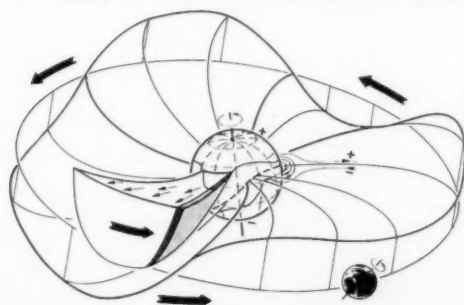
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H. Sato, H. Kodama, Kyoto University (Eds.)

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Proceedings of the 3rd Nishinomiya-Yukawa Memorial Symposium, Nishinomiya City, November 10-11, 1988

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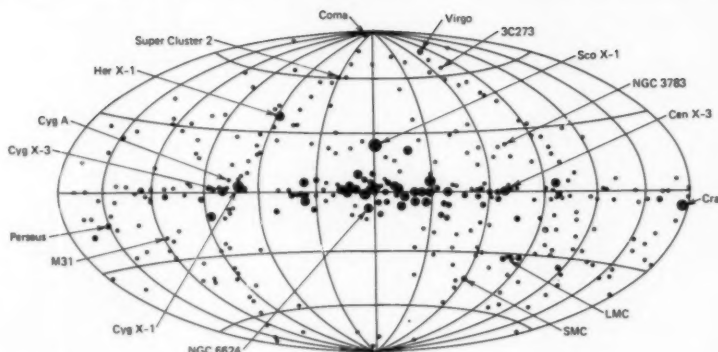
R. Wielen, Astronomisches Recheninstitut, Heidelberg (Ed.)

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